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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,814	03/28/2007	Raz Jelinek	4110-51	9338

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EXAMINER
SINGH, SATYENDRA K

ART UNIT	PAPER NUMBER
1657	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/573,814	JELINEK, RAZ	
	Examiner	Art Unit	
	SATYENDRA K. SINGH	1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *7-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's response (and claim amendments) filed on 03/09/2010 is duly acknowledged.

Claims 1-30 are currently pending in this application.

Claims 7-30 (non-elected inventions of groups II-VI) remain withdrawn.

Claims 1-6 (elected invention of group I) as currently amended are examined on their merits in this office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-6 (as currently amended) **are/remain** rejected under 35 U.S.C. 102(b) as being anticipated by JOHNSTON et al (1980).

Claims are directed to "**Isolated living cells** comprising nanopatch sensors **integrated** into the cell membrane thereof, wherein said sensors are provided in the form of perturbation-sensitive constructs, and wherein said perturbation-sensitive constructs respond to perturbations of the cell membrane by means of a detectable change in one or more physical or chemical properties associated with said construct, and wherein the nanopatch sensors are integrated into the cell membrane by polymerization ; the living isolated cells according to claim 1, wherein the perturbation-sensitive construct comprises a polymer associated with one or more lipid components; the living isolated cells according to claim 2, wherein the polymer is polydiacetylene (PDA); the isolated cells according to claim 3, wherein the PDA is a polymer of **10,12-tricosadiynoic acid**, and the lipid components are selected from the group consisting of dimyristoylphosphatidylglycerol, dimyristoylphosphatidylcholine and dimyristoylphosphatidylethanolamine; the living isolated cells according to claim 1, wherein the detectable change in the physical or chemical properties associated with the perturbation-sensitive constructs is a change in the visible range absorption spectrum of said cells; and the living isolated cells according to claim 1, wherein the detectable change in the physical or chemical properties associated with the perturbation-sensitive constructs is a change in the fluorescent emission spectrum of said cells."

Johnston et al disclose isolated, *Acholeplasma laidlawii* A cells comprising nanopatch sensors integrated (by UV-irradiation, using Mineralight R52 lamp) into the cell membrane thereof (i.e. cells grown on diacetylenic fatty acids; see summary on page 57, "*Scheme I*" on page 60, and Table I on page 61, in particular), wherein said sensors are provided in the form of perturbation-sensitive constructs, and wherein said perturbation-sensitive constructs respond to perturbations of the cell membrane by means of a detectable change in one or more physical or chemical properties associated with said construct; wherein the perturbation-sensitive construct comprises a polymer, polydiacetylene associated with one or more phospholipid components, wherein the PDA is a polymer of 10,12-tricosadiynoic acid, and the phospholipid component such as dimyristoylphosphatidylcholine (see pages 59-61; section "*Synthesis of diacetylenic acids*", "Scheme I" on page 60; and Table I on page 61, "*Diacetylenic phospholipids*", in particular); wherein the detectable change in the physical or chemical properties associated with the perturbation-sensitive constructs is a change in the visible range absorption spectrum, or a change in the fluorescent emission spectrum of said cells (taken as inherent physico-chemical property of the constructs integrated into cell membrane; which are disclosed by the prior art; see figures 1-4, and page 67, 1st and last paragraphs, in particular).

The limitations of "living" cells and "wherein the nanopatch sensors are integrated into the cell membrane by polymerization" is met by the cited prior art as Johnston et al disclose the fact that "*(P)reliminary experiments show that similar polymerization can be induced in Acholeplasma laidlawii cells grown on diacetylenic fatty acid*" (see "Summary", In particular). In addition, the fact that "*natural biomembrane studies*" were done by "*fatty acid incorporation in to micro-organisms*", which were "*subsequently polymerised by irradiation*" (see page 58, 2nd

paragraph, in particular), wherein the product of polymerization were disclosed to be the same as claimed in the instant invention as "nanopatch sensors" (see page 67, last paragraph, in particular), and which are disclosed to be useful as probe (i.e. intended use of sensors arranged in a crystalline phase in lipid bilayer membrane of cells) for sensing environmental changes in lipid bilayers (see page 67, 1st paragraph and "Conclusion", in particular).

As per MPEP 2111.01, *during examination, the claims must be interpreted as broadly as their terms reasonably allow. In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)(The USPTO uses a different standard for construing claims than that used by district courts; during examination the USPTO must give claims their broadest reasonable interpretation.). This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

Nonstatutory Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1-6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over at least claim 1 of copending Application No. 11/666,134 (same inventor). Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 in the copending application is also directed to "*A construct comprising functional membrane fragments and one or more perturbation-detecting polymers associated therewith, wherein said construct responds to perturbations of said membrane fragments by means of a detectable change in one or more physical or chemical properties associated with said construct*", which is deemed generic to the claimed invention in the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Applicant's Arguments

Applicant's arguments filed on 03/19/2010 (as they pertain to the prior art rejection of record) have been fully considered but they are not persuasive for the following reasons of record:

Regarding the 102b rejection over the cited prior art of Johnston et al, applicant initially argues that "*Johnston does not appear to enable the presently claimed invention...and it is unclear whether the Johnston cells are alive, or whether their treatment (irradiation) destroyed the cells*" (see remarks, pages 10-11, in particular). First, the claims are drawn to a product "isolated living cells comprising nanopatch sensors integrated into the cell membrane thereof", which has been fully disclosed by Johnson et al in a peer-reviewed journal and which does not indicate and/or suggest that the cells were damaged or destroyed upon irradiation-induced

polymerization of the diacetylenic fatty acids in the lipid membrane of cells (see "Conclusions", in particular). Second, applicant's argument that "*Jonhston does not teach or even mention "perturbation-sensitive" constructs* (see remarks, page 11, 3rd paragraph) is not found to be persuasive because Johnston et al explicitly state that *"(T)he fact that the spectrum of the polymer is sensitive to its local environment may also provide a useful probe for future studies of environmental changes in lipid bilayers*" (see Johnston et al, page 67, 1st paragraph, in particular), and therefore meet the limitations of intended use of sensors (which are disclosed to be arranged in a crystalline phase in lipid bilayer membrane of cells; see Johnston et al, page 68, "Conclusions", in particular) for sensing environmental changes in lipid bilayers, and thus as "perturbation-sensitive" constructs. Third, applicant's argument that "*...there is no way that the monomers will simply go to the cell membrane, pick up diacetylene fatty acids from the growth medium and be subsequently polymerized. Applicant believes that the diacetylene must be organized on the membrane in order for this to happen, and this is not taught or suggested by Johnston*", is noted and fully considered. However, it is not found to be persuasive because Johnston et al explicitly disclose the fact that "*similar polymerization can be induced in Acholeplasma laidlawii cells grown on diacetylenic fatty acid*" (see summary on page 57) and the fact that diacelylenic fatty acid were "*biosynthetically incorporated into the cells*" (see Johnston et al, age 67, last paragraph, in particular), which upon "*brief irradiation of cells*" produce "*visible spectral changes*" (i.e. possess inherent spectral and other characteristics of the product as claimed). Moreover, it is noted that instant claim 1, as currently presented, does not require any structural feature of the product (i.e. "nanopatch sensor" or "perturbation-sensitive constructs") that distinguishes itself over the cited prior art reference.

Fourth, applicant's argument that "*…it also appears that Johnston did not mention at all "nanopatch" organization. Reading Johnston, a person of ordinary skill in the art would understand that the entire cell membrane is covered (or comprises of) the chromatic molecules. This molecular-scale converage is quite different from nanopatches, as claimed*", is noted and fully considered. It is noted that applicant at page 5 of the instant disclosure states the fact that "The term "nanopatch sensors" is used to indicate that the perturbation-sensitive constructs are present within the cell membrane as **discrete patches** having dimensions in the range of 10 nanometers to several hundreds of nanometers", which is in concordance with the teachings of Johnston et al wherein they disclose the fact that "polymerization readily occurs when the lipids are in a **crystalline phase**" (i.e. a nanopatch; see summary and conclusions, in particular), and since they are sensitive to environment (i.e. "perturbation-sensitive"), they may be used as **probes** for environmental changes in lipid bilayers.

Fifth, applicant's argument that "*…the presently pending subject matter in an aspect requires PDA-labeled cells to analyze perturbation-sensitive molecules. In contrast, the color changes in Johnston are just induced by temperature (e.g., Johnston at 63-65), which is a different process. This distinction - i.e., perturbation as opposed to temperature - is notable*", is fully noted and considered. However, it is not found to be persuasive because the instant claims are drawn to a product which has been fully disclosed in the cited prior art, including the inherent functional properties such as sensing the "environmental changes in the lipid bilayer membrane" (i.e. acting as a probe; see Johnston et al, page 67, 1st paragraph), and thus it would be considered by an artisan of ordinary skill in the art as a *"perturbation-sensitive*" construct (see applicant's own disclosure for "*perturbations of the cell membrane*" on page 5, 2nd paragraph, in particular).

Thus, the argument that "*the lipid/PDA patches in the present case are not just fused/attached to the cell membrane, but essentially sense when membrane processes occur, such as membrane-active molecules insert into the cell membrane etc.*" is noted, however, is not found to be persuasive for the above reasons of record. In the absence of any distinguishing structural feature of the product over the disclosed product in the cited reference, the entire invention, as claimed, is deemed to be anticipated.

Regarding the provisional ODP rejection of record, it is noted that applicant has not provided a terminal disclaimer or an argument against the rejection (see remarks, dated 3/9/10; page 10, 3rd paragraph, in particular), and therefore, the ODP rejection over at least the claim 1 of co-pending application 11/666,134 (same inventive entity), as previously stated on record, is properly maintained.

Conclusion

NO claims are allowed.

Pertinent Prior Art:

1. ALONSO A. et al. Polymerisation of diacetylene fatty acid in cultures of *Bacillus cereus*, Biochimica et Biophysica Acta, 1982, volume 712, pages 292-298.

2. LEAVER J. et al. The biosynthetic incorporation of diacetylene fatty acids into the biomembrane of *Acholeplasma laidlawii* A cells and polymerisation of the biomembranes by irradiation with ultraviolet light, Biochimica et Biophysica Acta, 1983, volume 727, pages 327-335.

3. JELINEK R. et al. Interfacial catalysis by phospholipases at conjugated lipid vesicles: colorimetric detection and NMR spectroscopy, Chemistry & Biology, November 1998, volume 5, No. 11, pages 619-629.

4. RIBI (US 5,156,810)- Biosensors employing electrical, optical and mechanical signals (see column 12, 4rth paragraph, in particular).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SATYENDRA K. SINGH whose telephone number is (571)272-8790. The examiner can normally be reached on 9-5MF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JON P. WEBER can be reached on 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Satyendra K. Singh/
Examiner, Art Unit 1657

/JON P WEBER/
Supervisory Patent Examiner, Art Unit 1657